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Proyer, René T ; Gander, Fabian ; Brauer, Kay ; Chick, Garry

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Can Playfulness be Stimulated? A Randomised Placebo-Controlled Online Playfulness Intervention Study on Effects on Trait Playfulness, Well-Being, and Depression

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Background: While there are numerous applications of play-based interventions, there is little research on playfulness-based interventions. We applied interventions that aim at stimulating playfulness and test effects on happiness and depressive symptoms. **Method:** In a randomised placebo-controlled online intervention, $N = 533$ participants were assigned to one of three 1-week playfulness conditions (i.e. three playful things, using playfulness in a new way, and counting playfulness) or a placebo condition. Participants reported on global playfulness, facets of playfulness, well-being, and depression at pretest, posttest, and at follow-ups after 2, 4, and 12 weeks. **Results:** All interventions increased expressions in all facets of playfulness, had short-term effects on well-being, and ameliorated depression. **Conclusion:** Overall, findings suggest that playfulness can be stimulated by short self-administered interventions.

Keywords: depression, happiness, intervention, playfulness, well-being

INTRODUCTION

Adult playfulness is an understudied personality trait but over recent years interest in the study of playfulness has steadily increased and its importance for

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diverse topics such as sexual selection (Chick, 2001), education (Barnett, 2018; Boyer, 1997), academic achievement (Proyer, 2011), innovative behaviors at work (Bateson & Martin, 2013), or work engagement (Scharp et al., 2019) has been highlighted. Although playfulness robustly relates to positive outcomes across life domains, only little is understood as to whether (a) playfulness can be inculcated by self-directed activities and whether (b) this has an impact on well-being and depressive symptoms.

Playfulness as a Personality Trait

There is an important distinction between *play* (an actual behavior) and *playfulness* (the personality trait). Play in adults can have many different forms. These vary from play with words in social interactions to more structured forms (e.g. playing a boardgame), social forms (e.g. humorous teasing and banter among close friends and in romantic relationships), or role-play and enacting small scenes (e.g. when telling stories)—to name but a few. In its most basic form, playfulness can be understood as individual differences in the disposition to play. The main focus of research on playfulness has been directed at children (e.g. Barnett, 1991), but Lieberman (1977) already suggested that “... playfulness as a quality of play would developmentally transform itself into a personality trait of the player in adolescence and adulthood” (p. 23). A more recent definition of playfulness is: “... an individual differences variable that allows people to frame or reframe everyday situations in a way such that they experience them as entertaining, and/or intellectually stimulating, and/or personally interesting” (Proyer, 2017, p. 114). Numerous structural models of playfulness have been suggested; a comparatively new one (the OLIW-model) differentiates among four facets: *Other-directed* (*O*; i.e. enjoying playfully interacting with others; e.g. using playfulness to solve tension; breaking routines in close relationships by, for example, doing something unexpected; etc.); *Lighthearted* (*L*; i.e. seeing life as playground rather than battlefield; e.g. preferring to improvise rather than planning ahead; avoiding seriousness and preferring an easygoing approach towards life); *Intellectual* (*I*; i.e. enjoying play with ideas and preference for complexity over simplicity; e.g. dislike for routine tasks at work, but enjoying challenging and new activities that require novel approaches, etc.); and *Whimsical* playfulness (*W*; i.e. preference for unusual activities, things, or people; e.g. making amusing observations in everyday life situations that others would miss or liking to swim against the current/against mainstream preferences; Proyer, 2017). The OLIW-model extends the knowledge of which facets of playfulness relate to external criteria across domains of life; for example, in romantic life when analysing associations with love styles or relationship satisfaction (e.g. Proyer, Brauer et al., 2018, 2019), in relation to physical activity and indicators of mental and physical health (Proyer, Gander et al., 2018), and indicators of

creative thinking (Proyer, Tandler, & Brauer, 2019). We will use this model as a reference point in this research.

Playfulness Interventions

To the best of our knowledge, there is no study that has tested trait-wise changes in playfulness in adults in a placebo-controlled design. A partial exception may be programs targeting humor (see McGhee, 2010; Ruch & McGhee, 2014) that incorporate *playful* activities and behaviors. While it has been shown that these programs are effective (e.g. Ruch et al., 2018; Ruch & McGhee, 2014), they do not allow for commenting on the specific contribution of playfulness to their effectiveness due to the entanglement with humor. Nevertheless, these findings may be seen as initial evidence that playfulness may be malleable by deliberate interventions, despite its relative stability as a trait. This, however, has not yet been tested directly. We aim at narrowing this gap in the literature by testing changes in playfulness and its facets in a randomised controlled trial in an online setting with self-administered interventions. Given that people see many functions and uses of playfulness in their daily lives (e.g. to facilitate one's well-being or relationships; Proyer, 2014a), we suggest that they will also be able to actively engage in playful activities during the day. Other studies have shown that playfulness has high observability and is accessible via self-reports, which is helpful when developing and evaluating playfulness-based interventions (e.g. good convergence between self-ratings and play behaviors or ratings by knowledgeable others; Proyer, 2017; Proyer, Brauer et al., 2018).

Developing Playfulness Interventions in the Tradition of Positive Psychology Interventions

We develop our interventions in the tradition of online positive psychology interventions (PPIs); these are "... treatment methods or intentional activities aimed at cultivating positive feelings, positive behaviors, or positive cognitions" (Sin & Lyubomirsky, 2009, p. 467). Seligman and colleagues (2005) showed that the use of self-administered online interventions is associated with an increase in well-being and amelioration of depression, a finding that has been well replicated across a large number of studies (see meta-analyses by Bolier et al., 2013; Sin & Lyubomirsky, 2009). A recent re-analysis of these meta-analytic data highlights an important caveat of PPIs (White et al., 2019): Prior research has frequently employed small sample sizes and this may have led to a bias in the assessment of the effects of PPIs (i.e. comparatively small effects). This must be considered when developing interventions in this tradition.

Taking earlier research on PPIs into account (e.g. Gander et al., 2013; Seligman et al., 2005), in particular, the "three good things" and "using your signature strengths in a new way", interventions have demonstrated an increase in

well-being and an amelioration of depressive symptoms for up to 6 months in placebo-controlled online studies of non-clinical groups of adults.

The core of the “three good things” intervention is to set time aside before going to bed for 7 consecutive days to think about and write down the three “best” things that happened during the day as well as what feelings were experienced in these situations and who was present. In the past this activity was adapted to the “three funny things” intervention and found comparable effects (Gander et al., 2013; Wellenzohn et al., 2016, 2018). For the present study, we modified this to the “three playful things” intervention by asking participants to think about three playful things that happened during the day and to write them down. Table 1 gives a short description of the interventions and a link to the full instructions used.

The “using your signature strengths in a new way” intervention (Seligman et al., 2005) requires participants to complete a subjective measure of 24 strengths of character (i.e. morally positively valued traits) and to use those ranked highest (rank ordering of the strengths is used as an approximation of what strengths are *signature strengths*) in a new way over the course of the next 7 consecutive days. Wellenzohn et al. (2016, 2018) have developed a variant that focuses on using *humor* in a new way. Again, this had effects comparable to the original version. In the present study, we adapted this intervention to playfulness

TABLE 1
Brief Descriptions of the Three Intervention Groups and the Placebo Control Exercise

Intervention	Instruction (abbreviated): Participants were asked to ...
3 playful things	... think about <i>three playful things</i> that happened during the day. They were asked to set aside 15 minutes before going to bed for writing down the three playful things. Additionally, they noted who was involved and how they felt in the situation.
Using playfulness	... use their playfulness in a different way than they are used to (e.g. doing something playful at the workplace). They were asked to set aside 15 minutes before going to bed for writing down what they did. Additionally, they took notes of who was involved and how they felt in the situation.
Counting playfulness	... reflect on playful experiences they have had over the day (irrespective of whether this was an observation or whether they themselves were the actors). They were asked to set aside 15 minutes before going to bed for briefly writing down these experiences. Additionally, they counted the number of individual experiences and noted the total score.
Early memories (placebo control)	... write about their early memories from their childhood and should set aside 15 minutes before going to bed for this task (Seligman et al., 2005).

Note: All interventions including the early memories task were conducted for 7 consecutive days. The full instructions are provided online (German original and tentative English translations): osf.io/rd3qx/.

by instructing participants to use their playfulness in a different way from what they are used to (Table 1).

Finally, Otake et al. (2006) demonstrated that a simple “counting kindness” intervention had positive effects on well-being in a student sample (in the short term). The basic idea is to count self-performed acts of kindness and write down the number of kind acts performed every day each evening for 7 consecutive days. This finding has been replicated in a sample of German-speaking adults (Gander et al., 2013). In this study, we asked participants to reflect on playful experiences they have had over the day (for a week) and note the number of playful experiences (Table 1).

Overall, we expected an increase of self-reported playfulness across all intervention groups and facets of playfulness. Taking questions of the person \times activity fit into account, we will test whether those who are comparatively high in playfulness to begin with benefit more from the activities (cf. Lyubomirsky & Layous, 2013). In particular, *person features* seem to be of importance. Those higher in trait playfulness may be particularly skilled and motivated to think about and use their playfulness in everyday life. This is similar to findings on using one’s signature strengths in a new way, for which it was found that participants pursuing this intervention have an intrinsic understanding of how to engage with one’s strengths in everyday types of situations (Gander et al., 2013; Seligman et al., 2005). This may then have an effect on the baseline affective state of the participants and help them engage with the activities. In fact, the liking of the activity in the sense of an early reactivity (e.g. early increase in well-being following the intervention) and voluntary continuation are potent predictors of a successful intervention (Proyer et al., 2015). Also, in terms of the *hedonic adaption prevention* model (Sheldon & Lyubomirsky, 2012) one might argue that the activities that relate to playfulness allow for a broad variety of experiences and that those higher in playfulness may also particularly appreciate them in their daily lives. Hence, we tested for the moderating effects of baseline levels of trait playfulness on the findings. To do so, prior to the intervention all participants completed a short measure of global playfulness (Proyer, 2012a) to determine low and high scorers for the moderation analysis of the effects based on a multifaceted measure of playfulness (Proyer, 2017).

Effects of Playfulness on Well-Being and Depression

There is robust correlational evidence that playfulness relates positively to indicators of positive psychological functioning such as the three basic *orientations to happiness* and *happiness* (Proyer, 2012b, 2014b); *positive affect* (Barnett, 2011); *relationship satisfaction* (Aune & Wong, 2002; Proyer et al., 2019); *life satisfaction* (Proyer, 2012b, 2013); or self-and other-rated *physical fitness* (e.g. Proyer, Gander et al., 2018). Conceptual work has related playfulness to positive attributes such as *fun-seeking motivation* (Shen et al., 2014a, 2014b), *pleasure*

(Guitard et al., 2005), *fun* (Schaefer & Greenberg, 1997), or consider “*manifest joy*” as one of its integral components (Lieberman, 1977). Functions of playfulness related to well-being seem to be also part of laypersons’ implicit theories about playfulness (Guitard et al., 2005; Proyer, 2014a). Fredrickson (2003) proposes that “. . . joy and playfulness build a variety of resources. Consider children at play in the schoolyard or adults enjoying a game of basketball in the gym. Although their immediate motivations may be simply hedonistic—to enjoy the moment—they are at the same time building physical, intellectual, psychological, and social resources. The physical activity leads to long term improvements in health, the game-playing strategies develop problem solving skills, and the camaraderie strengthens social bonds that may provide crucial support at some time in the future . . .” (Fredrickson, 2003, p. 333). As an example, she further describes the relation between joy and play: “Joy, for example, encourages playful behavior. These broadened thought-action repertoires in turn build intellectual, physical, social and psychological resources for the future. Such resources translate into greater odds of survival and reproductive success” (Fredrickson, 2003, p. 333). Based on the cited research, we propose that encouraging playfulness in daily life has a positive effect on subjective levels of well-being and ameliorates self-reported symptoms of depression in samples of nonclinical adults in a randomised placebo-controlled trial.

Aims of the Present Study

This study has four main aims: First, we examine whether the self-administered online activities have an impact on the self-reported trait-levels of four facets of playfulness across four time points (posttest measured immediately after the intervention, and follow-ups after 2, 4, and 12 weeks) in a placebo-controlled design. Secondly, we test whether baseline levels in global playfulness moderate the effects of the intervention. Thirdly and fourthly, we test whether there is an increase of self-reports in *well-being* and an amelioration of *depressive symptoms* in each of the measurement time points compared with the baseline levels. Finally, given that earlier research has shown that baseline levels in the dependent variables have an impact on the outcomes (Proyer et al., 2015), we also test for their moderating effects on each of the four facets of playfulness as well as depressive symptoms and well-being. Taking into account the stability of trait playfulness (Proyer, 2017), previous findings on effects of PPIs (see White et al., 2019), and small effect sizes reported for interventional change of personality traits (e.g. Hudson et al., 2020; Yonatan-Leus et al., 2019), we expect to find effects of small-to-moderate size. We expected that the playfulness conditions would increase playfulness in comparison with participants receiving the placebo intervention. We had no a priori expectations on potentially differential effects of (a) the type of condition and (b) the OLIW facets (i.e. whether one facet is more strongly affected by the exercises than others).

METHOD

Sample

A total of $n = 1,727$ participants registered online while $n = 1,275$ participants fulfilled the inclusion criteria (i.e. not currently undergoing psychotherapeutic or psychopharmacological treatment, consuming illicit drugs, or being a minor), completed the baseline measures, and were randomised to the four conditions. The flow of participants is given in Electronic Supplementary Material (ESM) A.1.

The final sample of $N = 533$ participants (81.6% women) who completed the assigned exercise at all measurement time points was between 18 and 84 years of age ($M = 43.76$; $SD = 12.67$). Most participants held German (63.6%), Swiss (30.4%), or Austrian (5.1%) nationality. The largest part of the sample (61.7%) held a degree from a university or a university of applied sciences, or held a diploma allowing them to attend such universities (19.3%); 16.7 per cent had completed vocational training, while 2.3 per cent had only completed mandatory education (i.e. the lowest level of education).

Instruments

The *OLIW-playfulness questionnaire* (Proyer, 2017) assesses four facets of playfulness (i.e. Other-directed, Lighthearted, Intellectual, and Whimsical playfulness) with seven items each. In the present study, the *OLIW-S* (Proyer, Brauer, & Wolf, 2019), a short version with three items per facet, was used at baseline (i.e. prior to the intervention) and at all time points after the intervention. All items are measured on a 7-point Likert-type scale (1 = “does not apply at all” to 7 = “applies completely”; e.g. “I can use my playfulness to bring joy to other people or cheer them up”; Other-directed). Proyer and colleagues (2019) have provided comprehensive evidence on the factorial validity, good psychometric properties, and the nomological validity of the *OLIW-S*. The *OLIW-S* has been tested with respect to repeated administration in 199 participants for intervals of 1, 2, and 4 weeks, and 3 months: The retest-stability for the 3-month interval was .74/.77/.67/.84. In this study, internal consistencies across the five time points (medians) were acceptable; Other-directed: $\alpha = .69$; Lighthearted: $\alpha = .73$; Intellectual: $\alpha = .73$; and Whimsical: $\alpha = .83$.

The *Authentic Happiness Inventory* (Seligman, Steen, Park, & Peterson, 2005; German version by Proyer, Gander, Wellenzohn, & Ruch, 2017) is a 24-item measure for the assessment of global well-being, containing both aspects of subjective and eudemonic well-being. For each item, the respondent has to choose from among five statements the one that best describes his or her feelings during the past week. A sample set of statements ranges from 1 = “I have sorrow in my

life” to 5 = “My life is filled with joy.” Proyer et al. (2017) provide information on the validity of the measure and support its usefulness in intervention studies. Internal consistencies across the five time points were high; namely, $\alpha = .93/.95/.96/.96/.96$ for pretest, posttest, and follow-ups after 2, 4, and 12 weeks.

The *Center for Epidemiologic Studies Depression Scale* (CES-D; Radloff, 1977; German version by Hautzinger et al., 2012) is a 20-item measure for the assessment of the frequency and intensity of depressive symptoms in the past week. It uses a 4-point Likert-style scale ranging from 0 (“rarely or none of the time [< 1 day]”) to 3 (“most or all of the time [5–7 days]”) (e.g. “I thought my life had been a failure”). Higher scores denote a higher frequency/intensity of depressive symptoms. Hautzinger et al. (2012) report good psychometric properties. Internal consistencies across the five time points were high ($\alpha = .91/.90/.91/.91/.92$).

The *Short Measure of Adult Playfulness* (SMAP; Proyer, 2012a) is a short measure for assessing the easy onset and frequent display of playful behaviors with five items (e.g. “I am a playful person”) on a 7-point Likert-type scale (1 = “does not apply at all”; 7 = “applies completely”). It was used at baseline as grouping variable for the moderator analysis when comparing those low and high in playfulness. The internal consistency at pretest was high ($\alpha = .91$).

Procedure

The study was approved by the local ethics committee and participants provided informed consent. The complete study was conducted online and was advertised through mailing lists and university press releases. Participants were not aware of the existence of different conditions. Upon providing informed consent, participants registered online and provided basic demographic information, completed the pretest measures, were randomised to one of the four conditions (i.e. three playfulness interventions; one placebo condition; see Table 1) using an automated algorithm, and received their assigned intervention. At the immediate posttest and at the follow-ups after 2, 4, and 12 weeks, the participants were invited via email to return to the website to complete the follow-ups. Further, at the immediate posttest, participants indicated whether or not they had completed the assigned exercise. Those who failed to do so were excluded from subsequent analyses. Additionally, we asked participants at all follow-ups whether they continued the exercise beyond the instructed time period. After the last follow-up, they received automated feedback on their individual scores in well-being. There was no financial compensation for participation. In each condition, participants were provided with a definition of playfulness and short descriptions of the four facets along with the instructions and worksheets for 7 days in a single pdf file. The full instructions and worksheets for the interventions including a tentative English translation, and all data and syntaxes are openly available at osf.io/rd3qx/

RESULTS

Preliminary Analyses

Correlations among all measures at all time points are given as an online supplementary (Table A). First, we analysed whether the final sample (= completers) differed from those who were lost since randomisation (= dropouts; $n = 742$). The completers were on average four years older ($t_{1273} = 6.00$, $p < .001$; $d = 0.34$) and reported *lower* levels of depressive symptoms ($t_{1273} = -5.36$, $p < .001$; $d = 0.30$). There were negligible effects for being lower in global ($t_{1273} = -2.27$, $p = .023$; $d = 0.13$) and Other-directed ($t_{1273} = -2.70$, $p = .007$; $d = 0.15$) playfulness as well as higher well-being at baseline ($t_{1273} = 3.04$, $p = .002$; $d = 0.17$). However, completers and dropouts did not differ with regard to gender ($t_{1273} = -1.74$, $p = .082$), education (χ^2_1 , [$N = 1,275$] = 4.74, $p = .286$), and Lighthearted ($t_{1273} = -0.15$, $p = .883$), Intellectual ($t_{1273} = -0.11$, $p = .916$), or Whimsical playfulness ($t_{1273} = -1.40$, $p = .163$). Secondly, we compared the completers across the four conditions with regard to baseline scores in age, sex, education as well as well-being, depressive symptoms, and global playfulness and facets of playfulness. We found no differences among either the demographics or the dependent variables.

Table 2 gives the descriptive statistics and we found that the score distributions of the OLIW facets and the SMAP were comparable (i.e. within less than 0.5 *SD*) to prior studies in German-speaking samples (Proyer, Brauer, & Wolf, 2019) across all conditions. The same was true for expressions in well-being and depression in non-clinical populations (cf. Hautzinger et al., 2012; Proyer et al., 2017).

Evaluating the Interventions

Playfulness. For a first overview, mean scores and standard deviations for playfulness, well-being, and depression at all measurement time points (pretest, posttest and the 2-, 4-, and 12-week intervals) along with the sample sizes are given in Table 2 and displayed in ESM A.2. A visual inspection of the trajectories showed that they were, overall, in the expected direction.

For testing the impact of the three interventions against the placebo control condition, we computed Analyses of Covariance (ANCOVA) with the OLIW-scores (four separate analyses) of the posttests as dependent variables and those at the pretest as covariate. In every analysis, we compared each intervention condition individually with the placebo control condition. Additionally, we computed the same analyses predicting the averaged posttests (i.e. posttest, and follow-ups after 2, 4, and 12 weeks) for an overall estimation of the impact of the interventions. The ANCOVA-statistics for the effects of condition are given

TABLE 2
Means and Standard Deviations of the Three Playfulness Conditions and the Placebo Control at the Five Time Periods for Facets of Playfulness, Well-Being, and Depressive Symptoms

		<i>Pre</i>		<i>Post</i>		<i>2 Weeks</i>		<i>4 Weeks</i>		<i>12 Weeks</i>	
	<i>N</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
<i>Other-directed Playfulness</i>											
3 playful things	132	4.20	1.06	4.41	1.09	4.32	1.23	4.36	1.28	4.32	1.24
Using playfulness	126	4.20	1.17	4.53	1.34	4.43	1.35	4.40	1.33	4.39	1.37
Counting playfulness	135	3.93	1.28	4.30	1.22	4.25	1.31	4.21	1.35	4.34	1.31
PCC	140	4.00	1.18	4.07	1.18	3.92	1.26	3.90	1.24	3.95	1.22
<i>Lighthearted Playfulness</i>											
3 playful things	132	4.21	1.05	4.52	1.06	4.57	1.15	4.64	1.07	4.59	1.07
Using playfulness	126	4.29	1.15	4.77	1.10	4.79	1.03	4.68	1.03	4.70	1.09
Counting playfulness	135	4.36	1.21	4.61	1.14	4.65	1.15	4.66	1.17	4.70	1.18
PCC	140	4.43	1.05	4.50	1.04	4.55	1.07	4.64	1.07	4.63	1.01
<i>Intellectual Playfulness</i>											
3 playful things	132	4.10	1.16	4.37	1.08	4.35	1.17	4.34	1.18	4.43	1.13
Using playfulness	126	4.07	1.16	4.36	1.20	4.43	1.11	4.38	1.21	4.45	1.19
Counting playfulness	135	4.01	1.22	4.28	1.19	4.33	1.16	4.41	1.14	4.44	1.12
PCC	140	4.23	1.09	4.33	1.12	4.24	1.10	4.31	1.21	4.32	1.16
<i>Whimsical Playfulness</i>											
3 playful things	132	4.44	1.15	4.70	1.08	4.80	1.12	4.79	1.15	4.82	1.17
Using playfulness	126	4.40	1.21	4.71	1.22	4.80	1.22	4.84	1.19	4.84	1.20
Counting playfulness	135	4.45	1.22	4.59	1.28	4.57	1.31	4.62	1.30	4.69	1.26
PCC	140	4.32	1.19	4.50	1.19	4.45	1.17	4.59	1.25	4.56	1.24
<i>Well-Being</i>											
3 playful things	132	3.01	0.56	3.10	0.59	3.14	0.61	3.16	0.62	3.22	0.62
Using playfulness	126	3.09	0.52	3.24	0.51	3.24	0.56	3.25	0.54	3.23	0.59
Counting playfulness	135	3.13	0.56	3.26	0.57	3.26	0.58	3.24	0.64	3.30	0.61
PCC	140	3.01	0.55	3.08	0.56	3.09	0.59	3.08	0.58	3.12	0.54
<i>Depressive Symptoms</i>											
3 playful things	132	0.69	0.48	0.57	0.42	0.56	0.45	0.52	0.40	0.54	0.43
Using playfulness	126	0.59	0.39	0.45	0.34	0.49	0.40	0.47	0.35	0.54	0.46
Counting playfulness	135	0.62	0.44	0.47	0.41	0.48	0.41	0.53	0.49	0.50	0.45
PCC	140	0.64	0.48	0.57	0.43	0.58	0.42	0.58	0.44	0.59	0.47

Note: PCC = Placebo control condition.

in Table 3. In our analyses, we focus on standardised effect sizes ($\eta^2 \geq .01/.06/.13$ indicate small/medium/large effects; Cohen, 1988) as they allow us to evaluate effects independently from sample size and account for the dependence when testing changes by repeated measures. For transparency we also report *p*-values from traditional null-hypothesis significance tests in Tables 3 and 4.

TABLE 3
Overall Effects for Conditions and Separate Analyses for the Time Periods after the Intervention for Facets of Playfulness, Well-Being, and Depressive Symptoms (Controlled for Pretest Scores in the Dependent Variables)

	Overall		Post		2 Weeks		4 Weeks		12 Weeks		
	df	t	η^2	t	η^2	t	η^2	t	η^2	t	η^2
<i>Other-directed Playfulness</i>											
3 playful things	269	2.67**	.03	2.01*	.02	2.36*	.02	2.82**	.03	1.95*	.01
Using playfulness	263	3.41**	.04	2.92**	.03	3.28**	.04	3.23**	.04	2.49*	.02
Counting playfulness	272	4.00***	.06	2.85**	.03	3.72***	.05	3.27**	.04	4.23***	.06
<i>Lighthearted Playfulness</i>											
3 playful things	269	2.46*	.02	2.34*	.02	2.39*	.02	2.19*	.02	1.38	.01
Using playfulness	263	3.73***	.05	4.53***	.07	4.09***	.06	1.73*	.01	1.90*	.01
Counting playfulness	272	1.83*	.01	1.94*	.01	1.84*	.01	0.89	.00	1.40	.01
<i>Intellectual Playfulness</i>											
3 playful things	269	2.14*	.02	1.43	.01	2.20*	.02	1.36	.01	2.02*	.02
Using playfulness	263	2.48*	.02	1.42	.01	3.07**	.04	1.77*	.01	2.19*	.02
Counting playfulness	272	2.75**	.03	1.18	.01	2.61*	.02	2.73**	.03	2.48*	.02
<i>Whimsical Playfulness</i>											
3 playful things	269	2.17*	.02	1.33	.01	3.29**	.04	1.09	.00	1.79*	.01
Using playfulness	263	2.78**	.03	1.80*	.01	3.43**	.04	2.08*	.02	2.27*	.02
Counting playfulness	272	0.19	.00	0.22	.00	0.18	.00	0.91	.00	0.28	.00
<i>Well-Being</i>											
3 playful things	269	1.79*	.01	0.75	.00	1.21	.00	1.78*	.01	2.07*	.02
Using playfulness	263	2.37*	.02	2.58*	.03	2.05*	.02	2.30*	.02	0.94	.00
Counting playfulness	272	2.01*	.02	2.03*	.02	1.71*	.01	1.06	.00	1.85*	.01
<i>Depressive Symptoms (CES-D)</i>											
3 playful things	269	-1.84*	.01	-0.68	.00	-1.10	.00	-1.86*	.01	-1.51	.01

TABLE 3 (CONTINUED)

	<i>df</i>	<i>Overall</i>		<i>Post</i>		<i>2 Weeks</i>		<i>4 Weeks</i>		<i>12 Weeks</i>	
		<i>t</i>	η^2	<i>t</i>	η^2	<i>t</i>	η^2	<i>t</i>	η^2	<i>t</i>	η^2
Using playfulness	265	-2.10*	.02	-2.50**	.02	-1.37	.01	-2.03*	.02	-0.50	.00
Counting playfulness	272	-2.37*	.02	-.34*	.02	-2.08*	.02	-0.87	.00	-1.70*	.01

Note: Given are the effects of condition (1 = intervention condition; 0 = placebo control condition) in the prediction of the dependent variable after the intervention when controlling for the baseline scores in the dependent variable. Overall = all time points after the intervention averaged. η^2 = Partial eta squared, PCC = Placebo control condition. A positive *t*-value denotes higher scores in the intervention condition compared to the placebo control condition.

* $p < .05$; ** $p < .01$; *** $p < .001$ (one-tailed).

TABLE 4
Moderation Effects of Overall Playfulness for Facets of Playfulness, Well-Being, and Depressive Symptoms (Controlled for Pretest Scores in the Dependent Variables)

	OTD		LTD		INT		WHI		Well-Being		Depressive Symptoms	
	<i>t</i>	η^2	<i>t</i>	η^2	<i>t</i>	η^2	<i>t</i>	η^2	<i>t</i>	η^2	<i>t</i>	η^2
3 playful things	-1.09	.00	2.00*	.02	-2.12*	.02	-0.35	.00	-0.58	.00	-0.34	.00
Using playfulness	-1.04	.00	1.07	.00	-0.60	.00	-1.64	.01	-0.29	.00	-2.02*	.02
Counting playfulness	-3.19**	.04	-0.31	.00	-1.97*	.01	-1.71	.01	-2.04*	.02	-0.45	.00

Note: Given are the interaction effects between condition (1 = intervention condition; 0 = placebo control condition) and baseline scores in overall playfulness in the prediction of the dependent variable (all time points after the intervention averaged) when controlling for the baseline scores in the dependent variable. A positive *t*-value denotes that the intervention was more effective (in terms of differences in the dependent variable between intervention and placebo condition) with increasing scores of overall playfulness; negative *t*-values suggest that the intervention was more effective with decreasing scores of overall playfulness. η^2 = Partial eta squared, PCC = Placebo control condition.

* $p < .05$; ** $p < .01$; *** $p < .001$ (two-tailed). Degrees of freedom = 267 (3 playful things), 261 (Using playfulness), 270 (Counting playfulness).

Table 3 shows that there were overall effects for the interventions for all variables tested with the exception that there was no effect on Whimsical playfulness for the *counting playfulness* intervention. The effect sizes were of small-to-medium size ($.01 \leq \eta^2 \leq .06$; median = .02). The comparatively strongest effects were found for Other-directed playfulness; plus, a robust increase of Lighthearted playfulness in those that were instructed to use their playfulness in a new way.

When taking the single measurement time points into account, there were increases in all intervention conditions in all playfulness facets for up to 12 weeks. The exception was Lighthearted playfulness; for this facet, only those who used their playfulness in a new way reported increased scores up to 12 weeks. The strongest effect was found in the *using playfulness in a new way* intervention on Lighthearted playfulness at the 2-week post measure ($\eta^2 = .07$). Hence, all three interventions were effective in increasing most facets of playfulness for up to 3 months although the effects tended to decrease over time.

Well-Being and Depressive Symptoms. The same analyses were conducted for well-being and depressive symptoms (Table 3). Results suggested overall increases in well-being and decreases of depressive symptoms in all intervention conditions (see ESM A.3). The effects in well-being lasted up to 12 weeks for those who noted three playful things and counted playful things, while the latter condition also showed reductions in depressive symptoms for up to 12 weeks.

Testing Moderating Effects of Baseline Levels of Playfulness

We tested the effectiveness of the different interventions in relation to baseline levels of global playfulness. For this purpose, we repeated the previously reported analyses, but included the baseline level of global playfulness (SMAP) and its interaction with the condition as additional predictors.

Table 4 shows that there were several moderation effects of baseline levels of global playfulness, but no consistent pattern: The “three playful things” condition was more effective (i.e. larger differences between intervention and placebo control condition) with regard to increases in Lighthearted playfulness for those with higher baseline scores in global playfulness. However, higher baseline scores in global playfulness accompanied *smaller* increases in Intellectual playfulness in this condition. In the “Counting playfulness” condition, higher baseline scores in global playfulness went along with a lower effectiveness of the intervention for Other-directed and Intellectual playfulness, as well as well-being. In the “Using playfulness” condition, higher baseline scores in global playfulness occurred with stronger decreases in depressive symptoms.

DISCUSSION

To the best of our knowledge this is the first placebo-controlled online study with the aim of increasing levels of playfulness and testing effects on self-reported levels of well-being and depression. Although playfulness is considered to be a trait in most conceptualisations, we found small-to-moderate effects of change for a time span of up to 3 months and small effects with respect to increased well-being and amelioration of depression.

The findings show that using playfulness in a new way (for 1 week) demonstrated increases for all playfulness facets and measurement time points. It seems as if this is a potent strategy for increasing playfulness (in self-reports). It must be noted that most effects were small, but at least for the short term (2 weeks) larger effects were also observable. Gander et al. (2018) have shown that both cognitive and emotional foci are of importance. Hence, thinking about using one's playfulness in a new way and experiencing positive emotions when doing so may both be useful strategies for increasing playfulness. However, we did not require participants to send in their notes. Therefore, we cannot rule out that participants also favored other strategies when using playfulness in a new way (e.g. thinking about a wordplay or playing with language in a written form) and did not actively pursue greater playfulness in their daily lives.

The *three playful things* intervention demonstrated comparatively weaker and less systematic effects. We found small effects for up to 3 months for Other-directed playfulness and the largest effect for Whimsical playfulness after 2 weeks. Hence, reflecting about playfulness and pondering about emotions felt may be beneficial for some types of playfulness. Given that this activity is easy to conduct, it may be appealing to a broad range of people and also intuitively associated with a greater inclination to engage in playful thoughts and behaviors.

Counting playfulness mainly yielded effects for Other-directed and Intellectual playfulness. As this is the first intervention of this type, replication is warranted and further theoretical work needs to be done with regard to the intervention \times facet of playfulness interaction. This will show whether particularly those that enjoy interacting playfully with others and those that enjoy complexity are better in remembering playful incidents or whether they experience more of these.

Overall, the effect sizes were in line with expectations (e.g. White et al., 2019) as the interventions yielded small changes. For comparison, a recent meta-analysis of studies on volitional change of broad personality traits has shown that the highest observed change was 0.16 standard deviations (small effect size) for up to 16 weeks (Hudson et al., 2020). Hence, although effect sizes were numerically small we interpret the findings as initial evidence for the success of the interventions at least for short periods of time. Since all interventions demonstrated effects of change, an open question is whether there are additive effects and if completing the three interventions combined, simultaneously or

successively, would show larger effects compared to a single intervention (see Gander et al., 2013).

There were small and short-term effects on an increase in well-being and amelioration of depression across all tested conditions. Given the small effect sizes, the findings should not be over-interpreted. Nevertheless, playfulness-based interventions may have potential for positive psychological functioning. Of course, play and occupational therapy already use play(ful) techniques (see e.g. Berger et al., 2018) and there seems to be an increasing interest in the use of playfulness in therapeutic settings (e.g. Versluys, 2017; Yonatan-Leus et al., 2019, 2020). However, one might argue that a stronger consideration of playfulness in daily life may also potentially be beneficial to people that are currently not in clinical treatment.

Importantly, findings for the moderating effects of global playfulness were mixed and did not provide a clear pattern. In some cases, those with greater (overall) playfulness benefitted more (e.g. greater increases in Lighthearted playfulness in the “three playful things” activity), but there were also reverse effects (e.g. *lower* effects with respect to increases in Other-directed and Intellectual playfulness, and increases in well-being among those with higher global playfulness at baseline). Hence, there seem to be important interaction effects at work that cannot be fully understood with the present set of data. Future research should focus on a better understanding of how differences in single facets may moderate effects and whether interventions could be better tailored to individuals, such as assigning more cognitively playful activities to those with greater Intellectual playfulness. Currently, the data seem to suggest that there is some additional information in baseline levels of playfulness for estimating the effects of an intervention, but more research is needed for a better understanding of these effects. Perhaps research using the tenets of the *hedonic adaption prevention* model (Sheldon & Lyubomirsky, 2012) will help an understanding of perceived variety (e.g. variability of the experiences, or activities) in the conduct of the interventions. For example, one might investigate the impact of different types of experiences such as social, nature-based, or work-related experiences, or those based on physical activity.

Given that the total amount of time needed for conducting the interventions (i.e. 5–10 minutes on 7 evenings) the changes are comparatively large. We cannot comment on effects after 3 months but assume that they will be negligible unless people shift their focus towards a more playful outlook in life. Attention shifts have been described as one of the working mechanisms of positive psychology interventions (Wellenzohn et al., 2016). Additionally, it has been shown that those participants that voluntarily continued with their activities beyond the instructed time period benefitted most from interventions (Gander et al., 2013; Proyer et al., 2015; Seligman et al., 2005). A further question is whether we have truly changed trait playfulness or whether the participants have aggregated more state-like experiences across the study period due to the interventions and,

therefore, then scored higher in the follow-up measures (e.g. French & Sutton, 2010). Future studies with a longer follow-up measurement or the use of alternative methods (e.g. informant reports) will also be needed. Moreover, some participants did prolong their active participation after the 7 days (i.e. by continuing to complete the homework after day 7). While this prolonged practice accounted for some of the effects, the main conclusion that playfulness can be changed by deliberate interventions remained widely unaffected, even when excluding these participants.

While our findings are of an initial nature, it is desirable that future studies on interventions to increase playfulness address the question of what stimulates (deliberate) changes in playfulness—such knowledge could be used to further develop interventions. For example, the *trait activation theory* (Tett & Guterman, 2000) proposes that engaging in trait-relevant *situations* plays a role in the expression of trait-related behaviors; for example, to engage in behaviors related to *Other-directed* playfulness, a social situation is required (e.g. to tease someone in a playful manner). One might argue that future intervention approaches should implement tasks that request participants to seek and engage in certain situations (e.g. being with others) to allow for expressing playful behaviors as well as to analyse their role in changes in playfulness (e.g. by testing whether frequencies of engaging in trait-relevant situations are related to change; see Scharp et al., 2019). This would not only help to understand the mechanisms underlying change in playfulness but also in designing and supplementing intervention programs directed at the facets of playfulness.

A further direction might be the assessment of participants' willingness (i.e. "goals") to change their levels of playfulness. Recently, Hudson and colleagues (2019; see also Hudson & Fraley, 2015) have shown that there are interindividual differences in people's desire to change (aspects of) their personality. Thus, one might argue that interventions work particularly well when participants are *willing* to change their playfulness. Further, Hudson et al. used a 15-week longitudinal design in which participants could accept and engage in weekly "challenges" (i.e. trait-related behavioral goals) and found that engaging in such tasks—instead of just accepting them—was a potent predictor of change. Thus, future studies should examine the role of participants' willingness to change their playfulness.

Limitations

We used the *Short Measure of Adult Playfulness* (SMAP; Proyer, 2012a) for examining moderation effects of global playfulness. Future research should be based on a more sophisticated rationale for the analysis of sub-groups that are known to differ in their playfulness. Relatedly, it must be acknowledged that all ratings in this study are self-reports only. While this is common in this line of research, future research should also take into account ratings by knowledgeable

others (see e.g. Ruch et al., 2018), consider objective data (e.g. observations of playful behaviors), or momentary assessments. The latter would also allow for examining whether the interventions only affected *evaluations* of one's playfulness, or also actual experiences of playfulness (e.g. Kahneman & Riis, 2005). One might argue that the increases in the self-reports are a consequence of the added attention to one's playfulness whereas the playfulness *trait* has not changed. Using multiple data sources will help to address this problem and disentangle trait variance (i.e. playfulness) from measurement-related variance (i.e. response behaviors; Eid et al., 2003).

We focus our interpretation of the findings on small-to-medium effect sizes. Although our main focus was interpretations of standardised effect sizes instead of null-hypothesis significance tests, it must be acknowledged that we did not conduct additional controls for Type I error. Given the larger number of analyses run, caution against over-interpretation seems warranted. As mentioned, considering situational variables may be beneficial to direct and examine changes in (facets of) playfulness. For example, an activity aimed at Other-directed playfulness should have its primary effects there, while comparatively smaller effects would be expected for the other facets. Pending a replication of the findings, the generalisability is limited to a well-educated sample of mostly women from German-speaking countries with an interest in online self-administered positive psychology-type interventions. Additionally, we did not have a formal test, apart from self-reports, of whether participants had completed the assignments as instructed. Other types of administration (e.g. via Smartphone Apps) may provide a better control of how people engage with the activities. Participants in this study worked on their intuitive understanding of what playfulness is. It might be interesting to see whether more information about the nature of playfulness above what has been given would have made it easier for participants to use playfulness in their daily lives (e.g. more examples; "case reports" of playful activities of highly playful individuals; or the opportunity to get in touch with someone from the research team to get feedback on how playfulness could be incorporated into daily life). Additionally, there is the important question of what constitutes playful behaviors. While most people have an intuitive understanding about what playfulness is (see also Proyer, 2014a), its scientific definition is much more difficult and is a topic of ongoing debate. Hence, while we assume that people engaged in playful activities, their expression of them may have varied across individuals. As a consequence, it would be interesting to see whether more standardisation of the type of activities pursued has an even stronger impact on the findings.

As often in online intervention studies (e.g. Bolier et al., 2013), there was a considerable number of dropouts. Our dropout analysis has shown that participants who did not complete our study were on average younger and showed slightly increased symptoms of depressiveness and slightly lower levels in global and Other-directed facets of playfulness. This finding with regard to age is common in

self-administered interventions and has been reported earlier (e.g. Gander et al., 2018). Future research might clarify whether such interventions are less accepted by participants of a younger age with lower levels of playfulness and whether baseline depressive symptoms hinder self-administering the training due to motivational problems that go along with heightened depressiveness, for example.

In conclusion, our findings lend initial evidence to the notion that playfulness can be stimulated by following short self-administered tasks on a daily basis. As discussed, future research should further clarify the robustness of the findings over time and address the hypothesis that interventions will be more effective if they are better tailored to an individual's level of playfulness.

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OPEN PRACTICES

This study was not pre-registered. Data and materials are available in the Open Science Framework under osf.io/rd3qx.

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AUTHOR CONTRIBUTION

Conception of the work and data collection: RP and FG. Data analysis: RP, FG, and KB. Drafting and critical revision of the manuscript: RP, FG, KB, & GC.

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SUPPORTING INFORMATION

Additional supporting information may be found online in the Supporting Information section at the end of the article.